

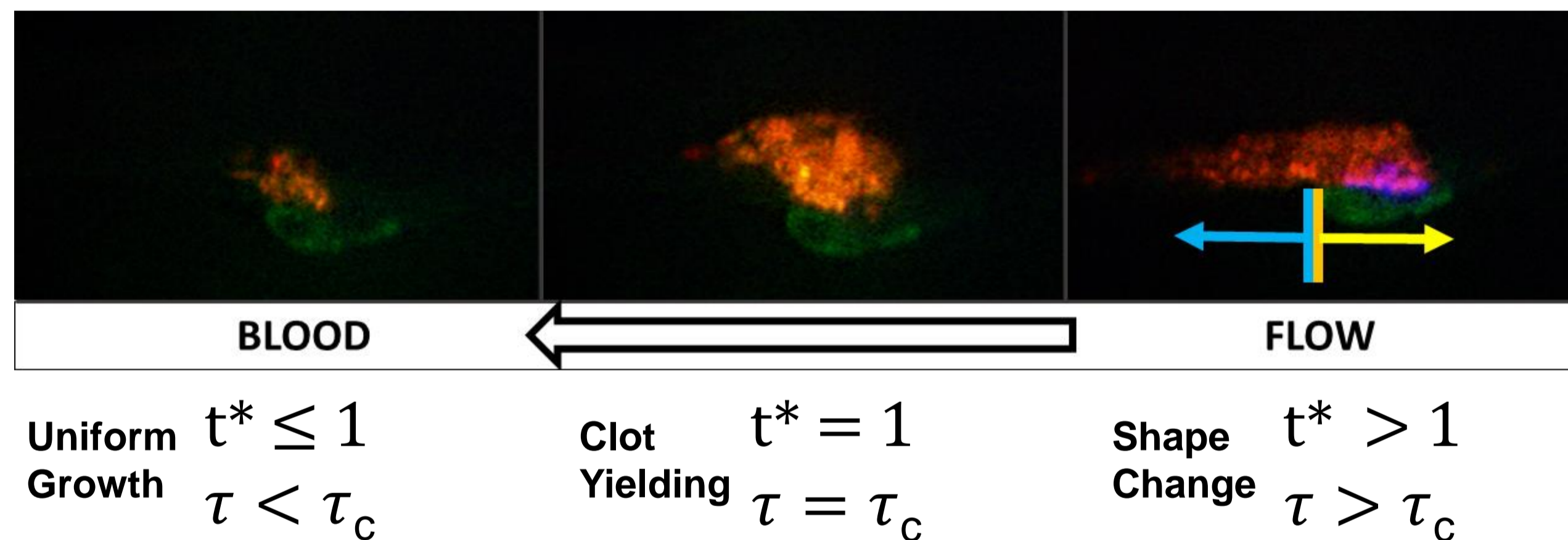
# IN VIVO MEASUREMENT OF BLOOD CLOT STRENGTH FROM COMPUTATIONAL FLUID DYNAMICS BASED ON INTRAVITAL MICROSCOPY IMAGES

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## Motivation & Goals

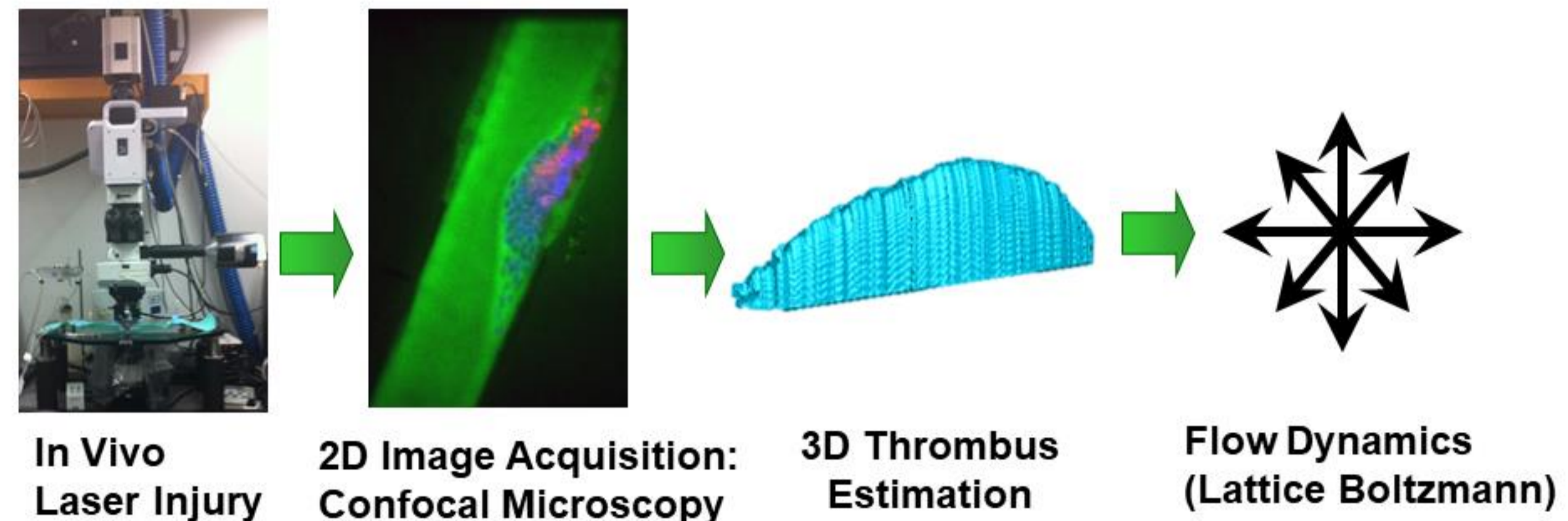
- Thrombo-embolic infarction is the major cause of mortality in the US
- Thrombi viscoelastic behavior resembles that of a Bingham fluid
- Calculate shear stresses at which the blood clot deforms and embolizes
- Lattice-Boltzmann Method based on Confocal Intravital Microscopy



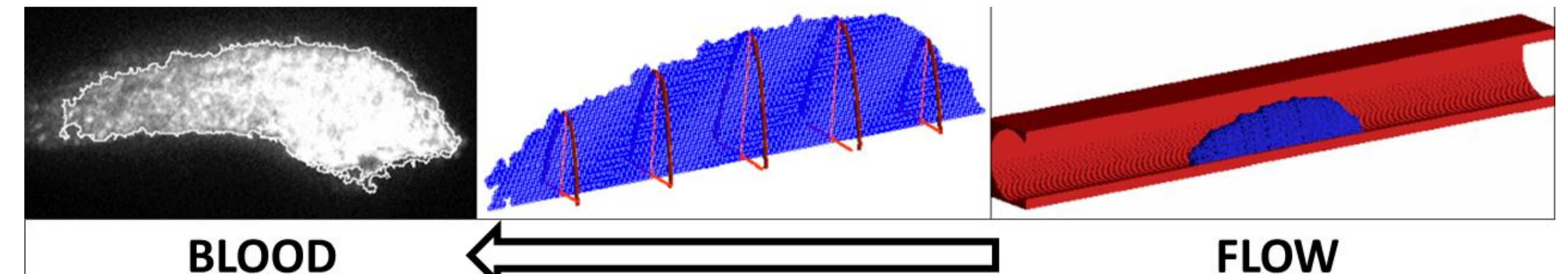
## Publications

- J.D. Welsh, T.J. Stalker, **R.S. Voronov**, R.W. Muthard, M.Tomaiuolo, S.L. Diamond, and L.F. Brass. **2014**, *Blood*. (Expected/Under Review).
- R.S. Voronov**, T.J. Stalker, L.F. Brass, and S.L. Diamond. *Annals of Biomedical Engineering*. **2013** Jun;41(6):1297-307. doi: 10.1007/s10439-013-0764-z. Epub 2013 Feb 20.
- Stalker TJ, Traxler EA, Wu J, Wannemacher KM, Cermignano SL, **Voronov RS**, Diamond SL, Brass LF. **2013**, *Blood*; Mar 7;121(10):1875-85. doi: 10.1182/blood-2012-09-457739. Epub 2013 Jan 9.

## METHODS AND TOOLS: IMAGE-BASED LBM FLUID DYNAMICS



## ESTIMATION OF THE 3D CLOT GEOMETRY FROM 2D CONFOCAL IMAGES:



## YIELD STRESS CALCULATION:

